

**Abstract:**

The present invention relates to the preparation of olefins or olefin mixtures having from 8 to 12 carbon atoms from one or more olefin(s) having from 4 to 6 carbon atoms by means of a four-stage synthesis. The four-stage synthesis comprises the steps of hydroformylation to form the aldehyde, hydrogenation to form the alcohol, elimination of water to form the 1-olefin and metathesis. The C<sub>8</sub>-C<sub>12</sub>-olefins obtained can be used, for example, for preparing plasticizer alcohols, in particular isononanol.